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An Intelligent Multi-Agent Based Decision Support System for Refugee Settlement Siting

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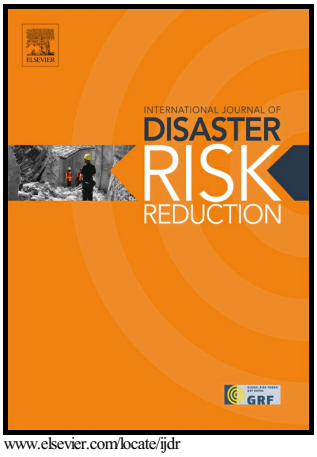

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PII: S2212-4209(18)30319-4
DOI: https://doi.org/10.1016/j.ijdrr.2018.06.013
Reference: IJDRR926

To appear in: *International Journal of Disaster Risk Reduction*

Received date: 8 March 2018
Revised date: 24 June 2018
Accepted date: 24 June 2018

Cite this article as: Maria Drakaki, Hacer Güner Gören and P. Tzionas, An Intelligent Multi-Agent Based Decision Support System for Refugee Settlement Siting, *International Journal of Disaster Risk Reduction,* https://doi.org/10.1016/j.ijdrr.2018.06.013

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An Intelligent Multi-Agent Based Decision Support System for Refugee Settlement Siting

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ABSTRACT

The refugee crisis resulted in a large influx of refugees in the Mediterranean since 2014. However, crises are inherently complex phenomena, whereas the ultimate goal of all involved actors is to provide humanitarian aid to the affected populations. The required supply chain management and logistics operations are characterized by complex decision making whereas coordination between involved actors is necessary for effective aid delivery. Therefore, distributed problem solving based on autonomous and interacting agent can be used as a decision support tool in this field. The purpose of this paper is to address the solution of the refugee settlement site planning problem with an intelligent multi-agent system (MAS) modeling method. In particular, intelligent agents use two well-known multi-criteria decision-making methods (MCDM), Fuzzy Analytical Hierarchy Process (FAHP) and Fuzzy axiomatic design approach with risk factors (RFAD), to rank alternative sites for refugee settlement siting. Up to authors' knowledge, this study is the first that utilizes MAS and MCDM approaches in a decision support system for refugee settlement planning in literature. The proposed method has been applied to evaluate four currently operating refugee accommodation sites in Greece. Obtained results have confirmed and reflected the current situation in these camp locations.

Keywords: Intelligent multi-agent system; refugee settlement siting; refugee crisis; decision support method.

Accepted manuscript

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